AMENDMENT TO CLAIMS

This list of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims

- 1. (Original). A method to stabilize high aspect ratio, post-etch lithographic feature against collapse, the method comprising the steps of:
 - (a) coating a substrate with a substantially organic underlayer;
- (b) coating said underlayer with a photoresist comprising materials that form a stable, etch-resistant, non-volatile oxide;
 - (c) imagewise exposing said photoresist to radiation;
 - (d) developing an image in said photoresist;
- (e) transferring said image through said underlayer into said substrate thus forming a high aspect ratio resist image; and
 - (f) treating said high aspect ratio resist image with a chemically-reducing plasma.
- 2. (Original). A method to stabilize high aspect ratio, post-etch lithographic feature against collapse, according to claim 1, wherein said photoresist comprises an element capable of forming a stable, etch-resistant, non-volatile oxide selected from the group consisting of silicon, phosphorous, germanium, aluminum, and boron.
- 3. (Currently amended). A method to stabilize high aspect ratio, post-etch lithographic images against collapse, according to claim 1, wherein said bilayer resist comprises is a bilayer resist comprising:

an organic underlayer formed on said substrate; and

- a photoresist comprising materials that form a stable, etch-resistant, non-volatile oxide formed on said underlayer.
- 4. (Original). A method to stabilize high aspect ratio, post-etch lithographic images against collapse, according to claim 1, wherein transferring said image comprises etching wherein said etching comprises passivating chemistry.

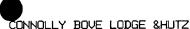


- A method to stabilize high aspect ratio, post-etch lithographic 5. (Currently amended). images against collapse, according to claim 34, wherein passivating chemistry comprises any process that generates hygroscopic moieties.
- A method to stabilize high aspect ratio, post-etch lithographic 6. (Currently amended). images against collapse, according to claim 34, wherein passivating chemistry comprises an SO2 and O₂ containing plasma.
- 7. (Original). A method to stabilize high aspect ratio, post-etch lithographic images against collapse, according to claim 1, wherein said chemically-reducing plasma comprises hydrogen.
- 8. (Original). A method to stabilize high aspect ratio, post-etch lithographic images against collapse, according to claim 1, wherein said chemically-reducing plasma comprises a hydrogengenerating species.
- 9. (Original). A method to stabilize high aspect ratio, post-etch lithographic images against collapse, according to claim 1, wherein said underlayer comprises an organic material selected from the group consisting of tuned polymers, novolacs, and low-k dielectrics.
- 10. (Original). A method to stabilize high aspect ratio, post-etch lithographic images against collapse, according to claim 1, wherein said underlayer comprises an organic material essentially comprising carbon, hydrogen, and oxygen.
- 11. (Original). A method to stabilize high aspect ratio, post-etch lithographic images against collapse, according to claim 1, wherein said photoresist comprises a polymer having acidcleavable moieties bound thereto.
- (Original). A method to stabilize high aspect ratio, post-etch lithographic images against collapse, according to claim 1, wherein said photoresist comprises a polymer formed by polymerizing one or more monomers selected from the group consisting of acrylate,

methacrylate, hydroxystyrene optionally substituted with C1-6-alkyl, C5-20 cyclic olefin monomers, and combinations thereof, the polymer having acid-cleavable moieties bound thereto, wherein all such moieties are silylethoxy groups optionally substituted on the ethoxy portion thereof with C_{l-6} -alkyl, phenyl, or benzyl.

- 13. (Original). A method to stabilize high aspect ratio, post-etch lithographic images against collapse, according to claim 1, wherein said photoresist comprises a radiation-sensitive acid generator.
- 14. (Original). A method to stabilize high aspect ratio, post-etch lithographic images against collapse, according to claim 1, wherein said radiation comprises electromagnetic radiation or electron beam radiation.
- 15. (Original). A method to stabilize high aspect ratio, post-etch lithographic images against collapse, according to claim 1, wherein said radiation comprises ultraviolet radiation or extreme ultraviolet radiation.

- 16. (Original). A method to stabilize high aspect ratio, post-etch lithographic images against collapse, according to claim 1, wherein said radiation comprises x-ray radiation.
- (Original). A method to stabilize high aspect ratio, post-etch lithographic images against collapse, according to claim 1, wherein transferring said image further comprises forming a reduced critical dimension bilayer resist image.
- 18. (Withdrawn). The stabilized high aspect ratio, post-etch lithographic image formed according to claim 1.
- 19. (Withdrawn). The semiconductor device fabricated using the stabilized high aspect ratio image formed according to claim 1.



- 20. (Original). A method of fabricating semiconductor devices using a stabilized, high aspect ratio bilayer resist image comprising the steps of:
 - (a) coating a substrate with an organic underlayer;
- (b) coating said underlayer with a photoresist comprising a material that form a stable, etch-resistant, non-volatile oxide;
 - (c) imagewise exposing said photoresist to radiation;
 - (d) developing an image in said photoresist;
- (e) transferring said image through said underlayer into said substrate thus forming a high aspect ratio resist image;
 - (f) treating said high aspect ratio resist image with a chemically-reducing plasma;
 - (g) transferring said image into said substrate forming a circuit image; and
 - (h) forming circuit element materials in said circuit image.
- 21. (Original). A method of fabricating semiconductor devices using a stabilized, high aspect ration bilayer resist image, according to claim 20, wherein said circuit element materials comprise materials selected from the group consisting of dielectric, conductor, semiconductor, and doped semiconductor materials.

- 22. (Withdrawn). The stabilized high aspect ratio, post-etch lithographic image formed according to claim 1, wherein said resist is a trilayer resist.
- 23. (Withdrawn). The stabilized high aspect ratio, post-etch lithographic image formed according to claim 22, wherein said trilayer resist comprises:

an organic resist;

an anti-reflective coating;

an inorganic hard mask; and

a thick organic layer.

24. (Withdrawn). The stabilized high aspect ratio, post-etch lithographic image formed according to claim 23, wherein said hard mask comprises silicon.



25. (Withdrawn). The semiconductor device fabricated using a reduced critical dimension bilayer resist image, according to claim 20.

H4 Cont 26. (Withdrawn). The semiconductor device fabricated using a stabilized high aspect ratio, postetch lithographic image formed according to claim 23.